AN EVALUATION OF THE WASHINGTON STATE DEPARTMENT OF LICENSING SPECIAL EXAM PROGRAM

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EXECUTIVE SUMMARY

Drivers with medical conditions, vision problems, and other physical disabilities are of special concern to state driver licensing authorities. Such drivers may pose higher than normal risks for motor vehicle collisions due to degraded driving skills. Licensing agencies are typically mandated to develop programs which identify these drivers and to take remedial actions in order to reduce collision risks.

Since the 1960's, the Washington State Department of Licensing has operated a "special exam" program for drivers with medical, vision, and physical impairments. The special exam includes an in-depth interview and an extended or specialized drive test, typically conducted in proximity to the person's residence. The most common outcome of the exam is to impose driving restrictions.

Policy questions can be raised as to whether the granting of restricted licenses to drivers with serious impairments compromises the safety of other persons who travel on public roads. In response to such concerns and as part of an overall review of agency policy in driver licensing and public safety, the Department of Licensing requested the Washington Traffic Safety Commission research office to conduct an evaluation of the special exam program.

The purpose of the present study was to evaluate the effectiveness of the special exam program in identifying drivers with impairments and in reducing their risk of collision involvement. The study compared driving performance of special exam drivers before and after the exam with a control group of other drivers matched on the basis of age, sex, and city of residence.

The findings of the study showed that drivers who received special exams had substantially worse driving records than Control group drivers both prior and subsequent to the exams.

The records of the exam drivers were also compared to the collision rate of the entire population of Washington licensed drivers. The post-exam collision rate of drivers who passed the exam was 3.24 collisions per 100 drivers per year. For comparison, in Washington State during 1996 there were 140,215 total collisions and 4,037,543 licensed drivers, yielding a rate of 3.47 collisions per 100 licensed drivers during this one year period. Thus, relative to the collision experience of the population as a whole, drivers who pass special exams, and receive consequent driving restrictions, appear not to pose an excess risk to public safety following the exam.

It was concluded that drivers selected for special exams have a higher risk of motor vehicle collisions than other demographically comparable drivers. However, this risk, following the exam, appears to be no greater than the average collision risk of the entire driving population.

The findings of the study also suggested that the special exam program has a beneficial effect on public safety among certain identifiable sub-groups of special exam drivers while failing to produce a positive outcome among other sub-groups.

It was recommended that the Department of Licensing conduct a rigorous policy review of the special exam program with the purpose of articulating the objectives of the program, enumerating the procedures used for identifying drivers required to take the exam, specifying the criteria to be used by Licensing Service Representatives in making pass - fail decisions, and reviewing procedures for monitoring the subsequent driving performance of special exam drivers.

INTRODUCTION.

Drivers with medical conditions, vision problems, and other physical disabilities are of special concern to state driver licensing authorities. Such drivers may pose higher than normal risks for motor vehicle collisions due to degraded driving skills. Licensing agencies are typically mandated to develop programs which identify these drivers and to take remedial actions in order to reduce collision risks. Remedial actions can include driver education classes, imposing driving limitations or restrictions, or cancellation of the drivers license. Issues surrounding a decision to remove a driver's license are complex and require the agency to seek a balance between an individual's need for transportation and mobility and the risks imposed on public safety.

Since the 1960's, the Washington State Department of Licensing (DOL) has operated a "re-exam and special exam" program for drivers with medical, vision, and physical impairments. These drivers come to the attention of DOL through a number of different processes including reports by law enforcement, physicians, family members, and by Licensing Service Representatives (LSR) who observe an impairment or disability when a driver comes to a DOL office for license renewal. The administrative procedures typically initiated in these circumstances are to require periodic certification by a physician that the driver's medical/vision condition is under control and/or to require that the driver take a "re-exam". This exam consists of a drive test, and a knowledge test may also be required, at the discretion of the LSR. Drivers who pass the re-exam are either granted a standard renewal of their license or a restricted license. The specific restrictions imposed on the driver are based on the judgement of the LSR and can include area, time, or equipment restrictions.

Drivers who fail the re-exam or those with medical/vision certificates that do not meet DOL standards have their licenses cancelled. However, these drivers may request a "special exam" in order to more completely assess their driving abilities and determine whether issuance of a license with driving restrictions may provide a reasonable compromise between the person's mobility needs and the interests of public safety.

The special exam includes an in-depth interview and an extended or specialized drive test, typically conducted in proximity to the person's residence. The particular requirements of the drive test depend on the LSR's assessment of the driver during the interview. For example, the drive test may be limited to specific roads or routes, such as "from home to the doctor's office, to the grocery store, and/or to church".

The possible outcomes of the special exam can be: a) failure, which results in license cancellation, b) passing the exam and continuation of a standard license,

or c) passing the exam and issuance of a restricted license. The most common outcome is to impose driving restrictions. Examples of area/time restrictions that can be imposed as a result of a special exam include the following: driving only within an "X" mile radius of the residence, driving only between the hours of 10 AM and 3 PM, daylight driving only, no freeway driving, and driving within the city limits only. Equipment restrictions include items such as corrective lenses, hand controls, outside vehicle mirrors, or power steering/brakes. In some cases, periodic medical or vision reports are required for drivers who retain a license.

Policy questions can be raised as to whether the granting of restricted licenses to drivers with serious impairments compromises the safety of other persons who travel on public roads. In response to such concerns and as part of an overall review of agency policy in driver licensing and public safety, the Department of Licensing requested the Washington Traffic Safety Commission research office to conduct an evaluation of the special exam program.

The purpose of the present study is to evaluate the effectiveness of the special exam program in identifying drivers with impairments and in reducing their risk of collision involvement. Data were obtained to provide a descriptive assessment of persons who receive special exams and to ascertain subsequent driving performance following an exam. The traffic citations and collisions of special exam drivers were compared to the driving records of a control group of individuals who had not had special exams.

METHOD.

Evaluation Design. The study used a "Exam Group vs. Control Group, before-after" evaluation design. Each driver in the Control Group was matched to a driver in the Exam Group on the basis of age, sex, and city of residence. Drivers in the Exam Group were divided into two sub-groups: those who passed and those who failed their exams.

The study groups were compared on driving performance measures before and after the date each driver received a special exam (or, in the case of Control Group drivers, an arbitrary date that was the same as the date for the matched Exam Group driver). Driving performance was measured in terms of the numbers of traffic collisions and citations on each driver's DOL record.

Subjects. The Exam Group subjects were drivers who had received a special exam during 1994. Control Group subjects were a matched random sample of drivers whose DOL records had no indication of a special exam during 1994. Subjects in both groups that had special exams or re-exams prior or subsequent to 1994 were included in the study. There were 7 subjects in the Control Group

with prior exams and 5 with subsequent exams. The Exam Group included 112 subjects with prior exams and 39 with subsequent exams.

Procedure. Subjects in the Exam Group were identified by a search of the DOL record system. All drivers who had special exams during 1994 were selected for the study. Any subject with more than one special exam in 1994 was included, and the date of the first exam was used. A total of 449 special exam drivers were identified and included in the study sample. Of this total, 380 drivers passed their special exams and 69, 15.4%, failed the exam.

Following selection of the Exam Group, subjects in the Control Group were identified and selected. Searches of the DOL record system were conducted based on the year of birth, sex, and city of residence for each subject in the Exam Group. From the list of potential Control subjects who met these criteria, one subject was randomly selected for the Control Group. Any driver who had a 1994 special exam was excluded from the list of potential Control subjects. For Exam subjects who resided in small towns, occasionally there were no potential Control subjects meeting the selection criteria. In this situation, another search was done using a different town with approximately the same size population. The final sample for the Control Group included 449 drivers.

Subjects were selected for the study in September 1997. Five-year driving record abstracts were requested in October 1997. Thus, a driving history was obtained for each subject that, on average, covered a 3.25 year period following the date of the 1994 exam and 1.75 years before the exam.

Following selection of the study subjects, a computer spreadsheet was created from the source documents obtained for the study. These documents included the special exam file, medical certificates, vision certificates, and driving record abstracts. The spreadsheet included data on demographic characteristics, the special exam, medical and vision afflictions, driver license status and restrictions, and traffic violations and collisions. The spreadsheet was imported into a statistical analysis program (SPSS) which was used for the data analyses.

RESULTS.

Subject Characteristics.

The majority of subjects in the study (57.2%) were male (42.8% were female), and these percentages were similar in each of the groups. The average age of all subjects in the study was 75.7 years. Subjects who failed the special exams were older, averaging 79.7 years. Control Group subjects averaged 75.6 years and subjects who passed the exam averaged 75.2 years. The overall age distribution for all study subjects was 12.5% under age 60, 40.2% between age

60 and 80, and 47.3% over age 80. Table A1 in the Appendix shows the age distribution for each of the study groups.

Nearly half of the study subjects, 48%, lived in smaller cities of under 25,000 population. Twenty eight percent lived in mid-sized cities, 25,000 to 100,000 population, and 24 percent resided in cities larger than 100,000. The study groups were comparable, with a slight over-representation of mid-sized city residents in the Failed Exam group. Table A2 in the Appendix shows the residence distribution of the study groups.

The reasons that drivers were given special exams are summarized in Table 1. The most common reasons were because of failing a re-exam (160 subjects, 36%), a vision certificate being filed with DOL (134 subjects, 30%), or a medical certificate being filed (65 subjects, 15%). Relatively few direct referrals to special exams were made by physicians, law enforcement, or Licensing Service Representatives. The category of "other" reasons includes referrals by family members and self-referral by the drivers themselves.

Table 1.

REASON * GROUP Crosstabulation

		GROUP		Total
		FAILED EXAM	PASSED EXAM	
LAW ENFORCEMENT	Count	6	12	18
	Percent	8.7%	3.2%	4.0%
LICENSING SERVICE REP	Count	9	24	33
	Percent	13.0%	6.3%	7.3%
MED CERTIFICATE	Count	8	57	65
	Percent	11.6%	15.0%	14.5%
OTHER	Count	1	13	14
	Percent	1.4%	3.4%	3.1%
PHYSICIAN	Count	8	17	25
	Percent	11.6%	4.5%	5.6%
FAILED RE-EXAM	Count	26	134	160
	Percent	37.7%	35.3%	35.6%
VIS CERTIFICATE	Count	11	123	134
	Percent	15.9%	32.4%	29.8%
Total	Count	69	380	449
	Percent	100.0%	100.0%	100.0%

The vision afflictions for the study subjects are shown in Table 2. For subjects with multiple vision problems, only the primary affliction noted on the DOL record is indicated in the table. Among subjects in the Fail exam and Pass Exam groups, macular degeneration and cataracts accounted for the majority of vision afflictions. Fifteen percent of the exam subjects had various other vision conditions; however, in most of these cases the specific type of vision problem was not indicated on the DOL record. In the Control group, five percent of the subjects had "other" vision afflictions noted on their DOL records, but none of these conditions required a special exam.

TABLE 2.

VISION AFFLICTIONS * GROUP Crosstabulation

		GROUP		
		CONTROL GROUP	FAILED EXAM	PASSED EXAM
NONE	Count	426	36	191
	Percent	94.9%	52.2%	50.3%
CATARACTS	Count		11	45
	Percent		15.9%	11.8%
DIABETIC RETINOPATHY	Count			14
	Percent			3.7%
MACULAR DEGENERATION	Count		12	71
	Percent		17.4%	18.7%
OTHER	Count	23	10	59
	Percent	5.1%	14.5%	15.5%
Total	Count	449	69	380
	Percent	100.0%	100.0%	100.0%

Vision acuity readings are summarized in Table 3. The vision readings reported are those obtained with the subjects using any required corrective lenses. The data in Table 5 are grouped in ranges of 20/20 to 20/39, 20/40 to 20/99, 20/100 to 20/199, and 20/200 or higher. A substantial number of subjects in the Pass Exam group had vision readings of 20/200 or higher (49 subjects, 13%), and an additional 12% had readings above 20/100 but under 20/200 (45 subjects, 12%). The majority of subjects with extremely poor vision (20/200+) were also afflicted with macular degeneration (35 out of 57, 61%). It is also of interest to note that extremely poor vision seemed not to be associated with old age; the percentage of subjects with 20/200+ vision was 12.5% for those under age 60, 12.8% for the 60 to 80 age group, and 12.7% for subject over age 80.

TABLE 3.

VISION READINGS * GROUP Crosstabulation

		GROUP		
		CONTROL GROUP	FAILED EXAM	PASSED EXAM
NO INFO ON DOL RECORD	Count	449	10	23
	Percent	100.0%	14.5%	6.1%
20/20 +	Count		12	44
	Percent		17.4%	11.6%
20/40 +	Count		38	219
	Percent		55.1%	57.6%
20/100 +	Count		1	45
	Percent		1.4%	11.8%
20/200 +	Count		8	49
	Percent		11.6%	12.9%
Total	Count	449	69	380
	Percent	100.0%	100.0%	100.0%

Medical afflictions are summarized in Table 4, and only the primary medical condition indicated on the DOL record is shown. Cardiovascular and psychiatric conditions were the most common medical afflictions (12.4% and 12.1%) among the subjects who passed the special exam. Psychiatric conditions include Alzheimer, bipolar disorders, dementia, and confusion/memory loss. A substantial number of exam failure subjects had psychiatric conditions (29%). Approximately 8 percent of the Control group subjects had medical afflictions noted on their DOL records, although these conditions were not severe enough to require a special exam.

TABLE 4.

MEDICAL AFFLICTIONS * GROUP Crosstabulation

		GROUP		
		CONTROL GROUP	FAILED EXAM	PASSED EXAM
NONE	Count	412	20	173
	Percent	91.8%	29.0%	45.5%
DIABETES MELLITUS	Count	3	2	27
	Percent	.7%	2.9%	7.1%
CARDIO-VASCULAR	Count	17	5	47
	Percent	3.8%	7.2%	12.4%
NEUROLOGICAL	Count	9	4	20
	Percent	2.0%	5.8%	5.3%
PSYCHIATRIC	Count		20	46
	Percent		29.0%	12.1%
STROKE/CEREBRAL VASCULAR	Count		4	21
	Percent		5.8%	5.5%
OTHER	Count	8	14	46
	Percent	1.8%	20.3%	12.1%
Total	Count	449	69	380
	Percent	100.0%	100.0%	100.0%

There was some overlap of medical and vision afflictions among the subjects in the study, as shown in Table A3 in the Appendix. Twelve percent of the Pass Exam group and 22 percent of the Fail Exam group had both types of conditions.

A summary of driving restrictions is shown in Table 5 which identifies the numbers of subjects with area/time and equipment restrictions. Many subjects in the Control group had equipment restrictions, but almost all of these were the use of corrective lenses. Nineteen control subjects had area/time restrictions that were unrelated to special exams. Three-fourths of the Fail Exam group had restrictions listed on their records even though virtually all had their licenses cancelled (67 of 69 drivers). Among subjects who passed a special exam, 6.3 percent had no restrictions imposed while the majority (67%) had both area/time and equipment restrictions.

TABLE 5.

RESTRICTIONS * GROUP Crosstabulation

		GROUP		
		CONTRL	FAILED	PASSED
NONE	Count	174	17	24
	Percent	38.8%	24.6%	6.3%
AREA/TIME	Count	1	1	37
	Percent	.2%	1.4%	9.7%
EQUIPMENT	Count	256	34	63
	Percent	57.0%	49.3%	16.6%
BOTH	Count	18	17	256
	Percent	4.0%	24.6%	67.4%
Total	Count	449	69	380
	Percent	100.0%	100.0%	100.0%

The status of each subject's license was ascertained when driving record abstracts were obtained. The vast majority of both the Control and Pass Exam groups had clear (valid) licenses as of October 1997 (see Table A4 in the Appendix). Six percent of the Pass group had voluntarily surrendered their licenses and 8.5 percent had their licenses cancelled by DOL at some time following the special exams. Almost all subjects who failed exams had cancelled licenses (97%). About four percent of the control subjects voluntarily surrendered their licenses.

Driving Performance Measures.

Driving records of the Control group and Exam group (Pass and Fail combined) are summarized in Table 6. The data presented are collisions and violations, both pre-exam and post-exam. The driving measures are given in terms of the number of incidents per 100 subjects per year; that is, the total number of incidents in each group was divided by the number of subjects and then divided by the average length of the observation period. For example, if there were 12 collisions in a group of 200 subjects, then the rate would be equal to 6 collisions per 100 subjects; and if the observation period was 3 years, then the rate would equal 2 collisions per 100 subjects per year. The reason for converting the data to yearly rates is because the pre- and post-observation periods differed in length (1.75 years pre-exam, and 3.25 years post-exam).

Subjects in the Control group had 3.8 collisions per 100 drivers per year in the "pre-exam" period and the collision rate dropped substantially in the "post-exam"

period to 1.2 collisions. The Exam group experienced a similar pre-post decrease in collisions, however, the collision rate was more than double that of the Control group in both time periods. All of these differences were statistically significant. A similar pattern was evident in the violation data; significant post-exam reductions in violations for both groups, but the Exam group had significantly more violations than the Control group.

TABLE 6.

DRIVING RECORDS FOR THE EXAM AND CONTROL GROUPS

GROUP		PRE-EXAM COLL	POST-EXAM COLL	PRE-EXAM VIOL	POST-EXAM VIOL
CONTROL	Rate	3.8180	1.1650	7.5087	2.2614
	N	449	449	449	449
EXAM	Rate	7.8906	2.7411	13.7448	4.4543
	N	449	449	449	449

Further analyses separately examined the subjects who passed the special exam and those who failed. These data are presented in Table 7. Subjects who failed the exam had worse driving records prior to the exam than those who passed. However, the Failure subjects had clean records following the exam. It would appear that the Failed exam subjects had terminated their driving. Comparing only the Pass Exam group with the Control group shows almost 3 times as many collisions in the post-exam period and more than twice as many violations.

TABLE 7.

DRIVING RECORDS FOR THE FAIL AND PASS EXAM GROUPS

GROUP		PRE-EXAM COLL	POST-EXAM COLL	PRE-EXAM VIOL	POST-EXAM VIOL
CONTROL	Rate	3.8180	1.1650	7.5087	2.2614
	N	449	449	449	449
FAIL EXAM	Rate	12.4224	.0000	15.7350	.0000
	N	69	69	69	69
PASS EXAM	Rate	7.0677	3.2389	13.3835	5.2632
	N	380	380	380	380

The violations and collisions of the Pass Exam group were examined in detail to ascertain whether these incidents occurred within the time and area restrictions that had been imposed on the drivers. Of 65 total post-exam violations in the

Pass group, only 2 occurred outside of a drivers' area and/or time restriction, and of 40 total post-exam collisions only 2 were outside of a driver's restrictions.

The data were analyzed to determine the severity of collisions in the Pass Exam and Control groups. In the Pass Exam group there was one fatal collision, 11 injury collisions, and 28 property-damage-only collisions during the post-exam period; (30% of the collisions resulted in injury or death). There were 17 collisions among Control group subjects, and 4 of these (23.5%) involved injuries.

The data were also analyzed to identify the number of collisions where a study subject was judged to be "at fault". The police collision report forms were examined in detail to determine if the subject was cited for a traffic violation as a result of the collision and/or if the officer's narrative report clearly identified the "at fault" driver. Subjects in single vehicle collisions were arbitrarily assigned to the "at fault" category. Of the 40 Pass Exam subjects involved in collisions, 27 or 68% were judged to be "at fault". In comparison, only 1 of 17 (6%) of the Control group subjects in collisions were "at fault".

Additional comparisons were made between the Control group and various sub-groups of subjects in the Pass Exam group. Table 8 shows the driving records of the Pass Exam subjects broken down by vision readings. Subjects with better vision readings tended to have worse driving records prior to their special exams, while the opposite pattern was evident in the post-exam time period. Poor vision readings were associated with poor driving records following the special exams. Subjects with 20/200+ vision had five times as many collisions and three times as many violations as did subjects with 20/20 vision. In comparison with the Control group, 20/200+ subjects had better records before the exams and substantially worse records following the exams; about six times more collisions and five times as many violations.

TABLE 8.

DRIVING RECORDS BY VISION READINGS

GROUP	VISION		PRE-EXAM COLL	POST-EXAM COLL	PRE-EXAM VIOL	POST-EXAM VIOL
CONTROL GROUP	Total	Rate	3.8180	1.1650	7.5087	2.2614
		N	449	449	449	449
PASS EXAM GROUP	NO INFO	Rate	4.9689	6.6890	22.3602	4.0134
		N	23	23	23	23
	20/20 +	Rate	10.3896	1.3986	24.6753	3.4965
		N	44	44	44	44
	20/40 +	Rate	7.8278	2.5290	12.0026	4.3555
		N	219	219	219	219
	20/100 +	Rate	7.6190	2.0513	16.5079	6.1538
		N	45	45	45	45
	20/200 +	Rate	1.1662	7.5353	2.3324	10.6750
		N	49	49	49	49
	Total	Rate	7.0677	3.2389	13.3835	5.2632
		N	380	380	380	380

The driving record data were also examined by the different types of vision afflictions among the Pass Exam subjects. Table 9 summarizes these data. Subjects in the Pass Exam group that had “other” vision afflictions had high rates of collisions and violation both before and after their exams. (The specific types of afflictions were not noted on the DOL records for these subjects.) Subjects with macular degeneration also had a high collision and violation rate during the post-exam period.

TABLE 9.

DRIVING RECORDS BY VISION AFFLICTIONS

GROUP	VIS AFFLICTION		PRE-EXAM COLL	POST-EXAM COLL	PRE-EXAM VIOL	POST-EXAM VIOL
CONTRL GROUP	Total	Rate	3.8180	1.1650	7.5087	2.2614
		N	449	449	449	449
PASS EXAM GROUP	NONE	Rate	8.6761	2.5775	16.1556	5.1551
		N	191	191	191	191
	CATARACTS	Rate	5.0794	2.0513	15.2381	2.0513
		N	45	45	45	45
	DIABETIC RETINOPATHY	Rate	12.2449	.0000	8.1633	2.1978
		N	14	14	14	14
	MACULAR DEGENERATION	Rate	3.2193	3.4670	6.4386	5.2004
		N	71	71	71	71
	OTHER	Rate	6.7797	6.7797	12.5908	8.8657
		N	59	59	59	59
	Total	Rate	7.0677	3.2389	13.3835	5.2632
		N	380	380	380	380

Driving records were examined by the types of medical afflictions among the subjects in the Pass Exam group, and these data are summarized in Table 10. Subjects with psychiatric, neurological, or stroke/cerebral vascular conditions had the highest collision rates in the post-exam period (rates of 3.1 to 4.7 collisions per 100 drivers per year) as well as high violation rates (7.3 to 8.0). Subjects with diabetes or cardiovascular conditions were comparable to the Control group during the post-exam time period.

TABLE 10.

DRIVING RECORDS BY MEDICAL AFFLICTIONS

GROUP	MED AFFLICTION		PRE-EXAM COLL	POST-EXAM COLL	PRE—EXAM VIOL	POST-EXAM VIOL
CNTRL GROUP	Total	Rate	3.8180	1.1650	7.5087	2.2614
		N	449	449	449	449
PASS EXAM GROUP	NONE	Rate	5.9455	3.5571	11.5607	6.0471
		N	173	173	173	173
	DIABETES MELLITUS	Rate	6.3492	1.1396	8.4656	2.2792
		N	27	27	27	27
	CARDIO-VASCULAR	Rate	7.2948	1.9640	20.6687	2.6187
		N	47	47	47	47
	NEUROLOGICAL	Rate	8.5714	3.0769	17.1429	7.6923
		N	20	20	20	20
	PSYCHIATRIC	Rate	12.4224	4.6823	23.6025	8.0268
		N	46	46	46	46
	STROKE/ CEREBRAL VASC	Rate	5.4422	4.3956	8.1633	7.3260
		N	21	21	21	21
	OTHER	Rate	6.2112	2.6756	6.2112	2.0067
		N	46	46	46	46
	Total	Rate	7.0677	3.2389	13.3835	5.2632
		N	380	380	380	380

Driving records of the Pass Exam group were analyzed by the reasons for the exam or the source of referral for the special exam. Subjects given a special exam because of referral by law enforcement, physician referral, or the filing of a vision certificate had the worst overall driving records compared to the Control group. Drivers identified by Licensing Service Representatives had a post-exam collision rate that was lower than other subjects in the Exam group and was comparable to the Control group. Subjects given special exams because of earlier failure of a re-exam had collision and violation rates somewhat above the Control group but lower than most other subjects in the Exam group. Table 11 summarizes these data.

TABLE 11.

DRIVING RECORDS BY REASON FOR THE SPECIAL EXAM

GROUP	REASON		PRE-EXAM COLL	POST-EXAM COLL	PRE-EXAM VIOL	POST-EXAM VIOL
CONTRL GROUP	Total	Rate	3.8180	1.1650	7.5087	2.2614
		N	449	449	449	449
PASS EXAM GROUP	LAW ENF	Rate	19.0476	7.6923	47.6190	5.1282
		N	12	12	12	12
	LSR	Rate	9.5238	1.2821	21.4286	3.8462
		N	24	24	24	24
	MED CERT	Rate	7.0175	2.6991	18.0451	7.0175
		N	57	57	57	57
	OTHER	Rate	8.7912	2.3669	17.5824	.0000
		N	13	13	13	13
	PHYSICIAN	Rate	6.7227	3.6199	20.1681	7.2398
		N	17	17	17	17
	FAILED RE-EXAM	Rate	8.1023	2.0666	10.2345	3.2147
		N	134	134	134	134
	VIS CERT	Rate	4.1812	4.7530	8.3624	7.2545
		N	123	123	123	123
	Total	Rate	7.0677	3.2389	13.3835	5.2632
		N	380	380	380	380

The age of the subjects had a relatively small influence on post-exam collision rates, but a fairly large effect on post-exam violation rates. Table A5 in the Appendix shows driving record data by age groups. Violation rates were substantially higher among subjects under age 60 in both the Pass Exam and Control groups.

The driving record data were analyzed by the population size of the city of residence. In the Control group, subjects who lived in small cities had a lower post-exam collision rate, while Pass Exam subjects residing in medium sized cities had higher collision rates. For post-exam violation rates, city size had no effect among Control group subjects. Small city residents in the Pass Exam group had a lower violation rate than subjects who lived in big cities. These data are summarized in Table A6 in the Appendix.

DISCUSSION.

Drivers who received special exams had substantially worse driving records than Control group drivers prior to the exams. This finding supports one of the premises of the special exam program; ie, drivers selected for special exams do, in fact, have an elevated risk of traffic collisions.

Drivers in both the Control and Pass Exam groups showed reductions in collisions and violations subsequent to the exams. The collision rate of the Control subjects decreased 69.4% and the rate of the Pass Exam subjects decreased 54.2% from the pre-exam to post-exam time periods. The decrease in the Control group most likely reflects a normal trend of less driving among older persons as they age; that is, over a five year period it is expected that a group of 75-year-old drivers will tend to reduce their driving or to stop driving altogether. The fact that the percentage decrease among the Exam subjects was smaller than Control subjects would appear to suggest that the special exam program did not lead to improvements in driving performance beyond what would have occurred in the normal course of events.

However, it is reasonably certain that the Pass Exam subjects drove fewer miles than Control subjects during the post-exam time period because of the driving restrictions imposed on them. It is likely, then, that if the special exam/restricted license program were not in existence, the subjects who passed the exam would have driven more miles than they did, and consequently, would have had higher collision rates than were found in the study.

While the records of drivers who passed the special exam were significantly worse than a peer group of drivers of the same age who drive in similar environments, it is informative to assess their driving performance relative to that of the entire driving population. The post-exam collision rate of the Pass Exam group was 3.24 collisions per 100 drivers per year. For comparison, in Washington State during 1996 there were 140,215 total collisions and 4,037,543 licensed drivers, yielding a rate of 3.47 collisions per 100 licensed drivers during this one year period. Therefore, relative to the collision experience of the population as a whole, drivers who pass special exams and receive consequent driving restrictions appear not to pose an excess risk to public safety following the exam.

Comparison of the population collision rate (3.47) to the pre-exam collision rate of the special exam group (7.89) also suggests that selection of these drivers for remedial action is clearly warranted based on a more than two-fold higher collision risk.

CONCLUSIONS.

Overall, the study data show that drivers selected for special exams pose a higher risk to public safety than other demographically comparable drivers. However, this risk following the exam appears to be no greater than the average collision risk of the entire driving population.

The findings of this study also suggest that the special exam program has a beneficial effect on public safety among certain identifiable sub-groups of drivers while failing to produce a positive outcome among other sub-groups.

Specifically:

1. The program appears to have a positive impact on traffic safety by eliminating driving among the individuals who fail the exam.
2. Also, positive outcomes, or at least driving records not substantially worse than the Control group, were found among sub-groups of drivers who passed the exam; specifically, those with good vision (20/20), those with cataracts or diabetic retinopathy vision conditions, those with diabetes mellitus or cardiovascular medical conditions, and those selected for special exams by Licensing Service Representatives or through the re-exam process.
3. Demonstrably negative outcomes were found among subjects with extremely poor vision readings (20/200 or worse), those with macular degeneration or "other" vision conditions, those with neurological, psychiatric, or stroke/ cerebral vascular medical conditions, and those referred for exams by law enforcement, physicians, or by vision certificates.

While these negative outcome findings point out some program deficiencies, the data also suggest that, overall, the program has been successful in finding a balance between the individual's need for transportation and mobility and society's interests in maintaining a reasonable level of safety on public roadways.

RECOMMENDATIONS.

It is recommended that the Department of Licensing conduct a rigorous policy review of the special exam program with the purpose of articulating the objectives of the program, enumerating the procedures used for identifying drivers required to take the exam, specifying the criteria to be used by Licensing Service Representatives in making pass - fail decisions, and reviewing procedures for monitoring the subsequent driving performance of special exam drivers.

Specific activities the Department may wish to consider include the following:

1. Review the policies and procedures used by other states in their programs for drivers with medical conditions, vision problems, and physical disabilities.
2. Conduct staff training to clearly define the goals and objectives of the DOL special exam program.
3. Management review and staff training to specify the procedures used to select drivers for the exam program and to make pass – fail decisions. In particular, the use of the driver's record as an additional tool for selecting drivers for the program should be considered.
4. Management review and staff training to determine whether different procedures are appropriate for dealing with different types of medical, vision, and physical problems. For example, it may be appropriate to use more stringent procedures and decision criteria when examining drivers with extremely poor vision.
5. Management review of the procedures for monitoring the post-exam driving record and potential deterioration in the driver's medical/vision/physical condition.
6. Since drivers with "other" vision afflictions had high post-exam collision and violation rates, it would be useful to ascertain the specific types of conditions included in this category.

APPENDIX

TABLE A1.

AGE * GROUP Crosstabulation

			CONTROL GROUP	FAILED EXAM	PASSED EXAM	Total
	UNDER 60	Count	56	2	54	112
		Percent	12.5%	2.9%	14.2%	12.5%
	60 TO 80	Count	181	30	150	361
		Percent	40.3%	43.5%	39.5%	40.2%
	OVER 80	Count	212	37	176	425
		Percent	47.2%	53.6%	46.3%	47.3%
Total		Count	449	69	380	898
		Percent	100.0%	100.0%	100.0%	100.0%

TABLE A2.

CITY * GROUP Crosstabulation

			CONTROL GROUP	FAILED EXAM	PASSED EXAM	Total
	BIG CITY	Count	109	17	87	213
		Percent	24.3%	24.6%	22.9%	23.7%
	MEDIUM CITY	Count	124	24	104	252
		Percent	27.6%	34.8%	27.4%	28.1%
	SMALL CITY	Count	216	28	189	433
		Percent	48.1%	40.6%	49.7%	48.2%
Total		Count	449	69	380	898
		Percent	100.0%	100.0%	100.0%	100.0%

TABLE A3.

MED AND VIS AFFLICTIONS * GROUP Crosstabulation

		GROUP		
		CONTRL	FAILED	PASSED
NONE	Count	391	1	29
	Percent	87.1%	1.4%	7.6%
MEDICAL	Count	35	34	161
	Percent	7.8%	49.3%	42.4%
VISION	Count	21	19	144
	Percent	4.7%	27.5%	37.9%
BOTH	Count	2	15	46
	Percent	.4%	21.7%	12.1%
Total	Count	449	69	380
	Percent	100.0%	100.0%	100.0%

TABLE A4.

LICENSE STATUS * GROUP Crosstabulation

		GROUP		
		CONTRL	FAILED	PASSED
CANCELLED	Count	4	67	32
	Percent	.9%	97.1%	8.5%
CLEAR	Count	428	1	316
	Percent	95.3%	1.4%	84.0%
DECEASED	Count			3
	Percent			.8%
SURRENDERED	Count	16		23
	Percent	3.6%		6.1%
SUSPENDED	Count	1	1	2
	Percent	.2%	1.4%	.5%
Total	Count	449	69	376
	Percent	100.0%	100.0%	100.0%

(Note: status was unknown for 4 Pass Exam subjects.)

TABLE A5.

DRIVING RECORDS BY AGE GROUP

GROUP	AGE GROUP		PRE-EXAM COLL	POST-EXAM COLL	PRE-EXAM VIOL	POST-EXAM VIOL
CONTROL GROUP	UNDER 60	Rate	2.0408	1.6484	25.5102	8.2418
		N	56	56	56	56
	60 TO 80	Rate	5.0513	1.1900	6.3141	2.3799
		N	181	181	181	181
	OVER 80	Rate	3.2345	1.0160	3.7736	.5806
		N	212	212	212	212
	Total	Rate	3.8180	1.1650	7.5087	2.2614
		N	449	449	449	449
PASS EXAM GROUP	UNDER 60	Rate	10.5820	3.4188	21.1640	11.3960
		N	54	54	54	54
	60 TO 80	Rate	6.0952	2.8718	12.9524	4.7179
		N	150	150	150	150
	OVER 80	Rate	6.8182	3.4965	11.3636	3.8462
		N	176	176	176	176
	Total	Rate	7.0677	3.2389	13.3835	5.2632
		N	380	380	380	380

TABLE A6.

DRIVING RECORDS BY SIZE OF CITY

GROUP	CITY SIZE		PRE-EXAM COLL	POST-EXAM COLL	PRE-EXAM VIOL	POST-EXAM VIOL
CONTROL GROUP	BIG CITY	Rate	3.6697	1.6937	7.3394	1.9760
		N	109	109	109	109
	MEDIUM CITY	Rate	3.6866	1.4888	5.0691	2.2333
		N	124	124	124	124
	SMALL CITY	Rate	3.9683	.7123	8.9947	2.4217
		N	216	216	216	216
	Total	Rate	3.8180	1.1650	7.5087	2.2614
		N	449	449	449	449
PASS EXAM GROUP	BIG CITY	Rate	5.9113	2.8294	14.4499	8.8417
		N	87	87	87	87
	MEDIUM CITY	Rate	9.3407	4.7337	13.7363	5.6213
		N	104	104	104	104
	SMALL CITY	Rate	6.3492	2.6048	12.6984	3.4188
		N	189	189	189	189
	Total	Rate	7.0677	3.2389	13.3835	5.2632
		N	380	380	380	380